UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,744	07/03/2003	Roderick MacKinnon	600-1-220CIP1DIV	5620

23565 7590 11/06/2006

KLAUBER & JACKSON
411 HACKENSACK AVENUE
HACKENSACK, NJ 07601

EXAMINER	
STANDLEY, STEVEN H	

ART UNIT	PAPER NUMBER
1649	

DATE MAILED: 11/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/613,744	MACKINNON, RODERICK	
	Examiner	Art Unit	
	Steven H. Standley	1649	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *24 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) *1-15,17-22,30-36 and 45-58* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16,23-29 and 37-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: ~~Attached~~

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II (claims 16, 23-29, and 37-44) in the reply filed on 7/24/06 is acknowledged. After a review of the claims the examiner determined that claims 16 and 23 had been mis-grouped into group II when in fact the claims are to a polypeptide and not a nucleic acid or a method of making. The examiner called Sarah J. Fashena, the attorney of record, and gave here the opportunity again to choose a group in consideration that claims 16 and 23 were actually part of Group I. She elected Group II again. Therefore, claims 24-29 and 37-44 are now under consideration.

Priority

2. SEQ ID NO: 17 was disclosed in the application 09/045529. Therefore the priority is set at 3/20/1998.

Claim Objections

3. Claim 25 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 25 is dependent on claim 24, however claim 25 could be infringed without infringing on claim 24. Therefore it is not limiting but broader in scope.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 24-29 and 37-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims all recite 'degenerate variants' or 'conservative variants' thereof. However, the specification does not define 'degenerate variants' and defines conservative variants very broadly. Further, 'degenerate variants' refers to both nucleic acids and polypeptides in the specification, indicating 'degenerate variants' is not used by the applicant to mean nucleic acid variants that vary at the third position in each codon. Therefore written description of 'degenerate variants' is lacking. On page 51 conservative substitutions are defined on lines 10-15 as being substitution with amino acids having a 'particular size' or 'characteristic' without providing any further detail as to what constitutes a conservative substitution.

The claims are drawn polypeptides or nucleic acids that are 'degenerate variants' or 'conservative variants. Many claims (24-29, and 37-44) do not require that the polypeptides, or the nucleic acid encoding the polypeptide, possess any particular biological activity, nor any particular conserved structure,

or other disclosed distinguishing feature. Therefore, there are no clear structural limitations on the complex of polypeptides claimed.

To provide evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. In the instant application, no such distinctions have been made. The factors to be considered include disclosure of complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, methods of making the claimed product, or any combination thereof. In this case, the only factor present are degenerate or conservative variants of an 'ion channel, or no functional recitation at all (see above).

Accordingly, in the absence of sufficient recitation of distinguishing identifying characteristics, the specification does not provide adequate written description of the claimed genus.

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed.*" (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See *Vas-Cath* at page 1116). As discussed above, the skilled artisan cannot envision the detailed chemical structure of the encompassed genus of polynucleotides, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written

description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required. See *Fiers v. Revel*, 25 USPQ2d 1601 at 1606 (CAFC 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016.

One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481 at 1483. In *Fiddes*, claims directed to mammalian FGF's were found to be unpatentable due to lack of written description for that broad class. The specification provided only the bovine sequence.

Therefore, only polypeptides comprising the nucleic acid (SEQ ID NO: 17) encoding the amino acid sequence set forth in a SEQ ID NO: 16, but not the full breadth of the claim meets the written description provision of 35 U.S.C. §112, first paragraph. Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 U.S.C. §112 is severable from its enablement provision (see page 1115).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 24-29, and claims 37-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recited "the prokaryotic channel of claim 15 encoded by a DNA sequence of SEQ ID NO: 17, ***or degenerate variants thereof***." It is not clear whether 'degenerate variants thereof' refers to the polypeptide or the nucleic acid. This is also the

case in claims 23-29. That is, it is unclear whether the claims refer to variants of nucleic acids or variants of the ion channel. Claims 37-43 are rejected as they depend from rejected claims.

6. Claims 25, 27-29, 37-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites hybridization at "standard conditions." The specification provides "standard conditions [page 62]" as a Tm of 55°C, which is incomplete. Probe length and the precise details of hybridization buffer and washing conditions also influence hybridization. Therefore the meets and bounds of claim 25 are not known. Further, the claim recites a nucleic acid "hybridizable to" which has no structural definition other than being a nucleic acid having the capacity to bind. Thus it does not even require that it binds or hybridizes. Claims 27-29 and 37-43 are rejected as they depend from claim 25.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 24-25, 29, and 37-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Schrempf et al (1995).

Schrempf et al disclose the KcsA channel nucleic acid and corresponding amino acid sequences (see Figure 1, page 5171; see also appendix b and c). The KcsA of Schrempf is reasonably a "degenerate variant," meeting the limitations of claims 16 and 23-24, and also has conservative substitutions which makes it a 'conserved variant of' as it relates to claim 29 and 44 (see amino acid 61, for instance). Moreover, the definition in the specification for 'conservative substitution (detailed above)' is sufficiently vague as to include any amino acid as a conservative substitution. Schrempf et al disclose several cloning vectors including those of e coli with the Lac regulatory promoter region (see page 5176, right col; see appendix A). Schrempf et al disclose plasmids with origins of replication (see PQE-32; appendix A, noted on page 5176 of Schrempf et al). Schrempf et al grow and isolate the channel from e coli bacteria (see page 5176) and isolate the protein for liposomes (see bottom right, page 5176). Thus, the limitations of claims 37-44 are met.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 24-29, and 37-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schrempf et al (1995) and in further view of Wilkinson (1995)

Schrempf et al teaches the nucleic acid (and protein) as described above.

Schrempf et al does not teach detectably labeling a nucleic acid 'hybridizable' to SEQ ID NO: 17 that is detectably labeled.

Wilkinson teaches labeling both RNA and DNA probes for detection of endogenous mRNA by in situ hybridization. Wilkinson's teaches both radioactive (page 20, left col) and non radioactive probes such as fluorescein (page 20, left column).

One would have a reasonable expectation of success because this technique works for every DNA/RNA. One of ordinary skill in the art would be motivated to combine the teachings of Schrempf et al with those of Wilkinson because Wilkinson teaches that labeling and in situ hybridization allows one to define spatial expression patterns of the mRNA in an organism and the labeled probe can also be used as a marker of tissue identity or physiological state (see page 20, top left, Wilkinson)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Standley whose telephone number is **(571) 272-3432**. The examiner can normally be reached on Monday through Friday, 8:00 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on **(571) 272-0867**.

The fax number for the organization where this application or proceeding is assigned is **703-872-9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see **http://pair-**

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

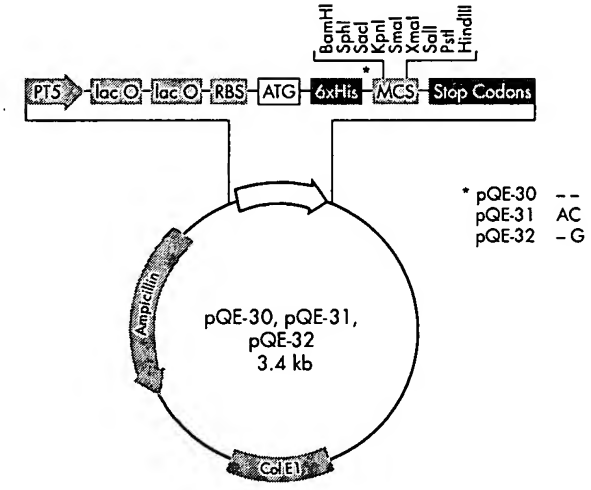
Steve Standley, Ph.D.
10/22/06

DAVID S. ROMEO
PRIMARY EXAMINER

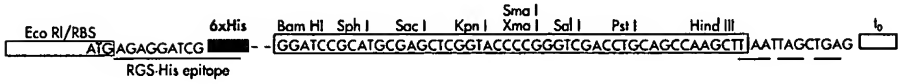
Appendix A

pQE-30, pQE-31, and pQE-32 Vectors

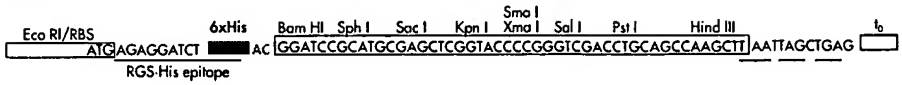
Positions of elements in bases	pQE-30	pQE-31	pQE-32
Vector size (bp)	3461	3463	3462
Start of numbering at XhoI (CTCGAG)	1–6	1–6	1–6
T5 promoter/lac operator element	7–87	7–87	7–87
T5 transcription start	61	61	61
6xHis-tag coding sequence	127–144	127–144	127–144
Multiple cloning site	145–192	147–194	146–193
Lambda t_0 transcriptional termination region	208–302	210–304	209–303
rrnB T1 transcriptional termination region	1064–1162	1066–1164	1065–1163
ColE1 origin of replication	1638	1640	1639
β-lactamase coding sequence	3256–2396	3258–2398	3257–2397



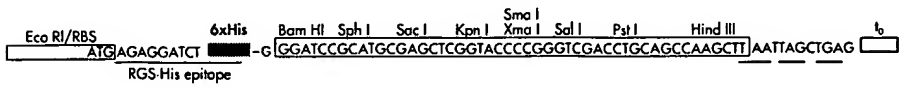
pQE-30



pQE-31



pQE-32



Appendix b

RESULT 1
S60172
potassium channel protein - Streptomyces lividans
C;Species: Streptomyces lividans
C;Date: 15-Feb-1996 #sequence_revision 01-Mar-1996 #text_change 09-Jul-2004
C;Accession: S60172
R;Schrempf, H.; Schmidt, O.; Kuemmerlen, R.; Hinnah, S.; Mueller, D.; Betzler, M.; Ste
EMBO J. 14, 5170-5178, 1995
A;Title: A prokaryotic potassium ion channel with two predicted transmembrane segments
A;Reference number: S60172; MUID:96080152; PMID:7489706
A;Accession: S60172
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-160
A;Cross-references: UNIPROT:Q54397; UNIPARC:UPI000012DCD7; EMBL:Z37969; NID:g1089905;

Query Match 98.0%; Score 800; DB 2; Length 160;
Best Local Similarity 98.1%; Pred. No. 5.3e-69;
Matches 157; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

```
Qy          1 MPPMLSGLLARLVKLLLGRHGSALHWRAAGAATVLLVIVLLAGSYLAVLAERGAPGAALI 60
              |||||||||||||||||||||||||||||||||||||||||||||||||||||||||| ||
Db          1 MPPMLSGLLARLVKLLLGRHGSALHWRAAGAATVLLVIVLLAGSYLAVLAERGAPGAQLI 60

Qy         61 SYPDALWWSVETATTVGYGDLYPVTLWGRLVAVVVMVAGITSFGLVTAALATWFVGREQE 120
              :|| ||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 TYPRALWWSVETATTVGYGDLYPVTLWGRLVAVVVMVAGITSFGLVTAALATWFVGREQE 120

Qy        121 RRGHFVRHSEKAAEEAYTRTTRALHERFDRLERMLDDNRR 160
              ||||||||||||||||||||||||||||||||||||||||
Db        121 RRGHFVRHSEKAAEEAYTRTTRALHERFDRLERMLDDNRR 160
```

Appendix C

```
RESULT 2
SLSKC1G
LOCUS       SLSKC1G                 1161 bp    DNA     linear   BCT 18-APR-2005
DEFINITION  S.lividans skc1 gene for potassium channel protein.
ACCESSION   Z37969
VERSION     Z37969.1  GI:1089905
KEYWORDS    potassium channel protein; skc1 gene.
SOURCE      Streptomyces lividans
  ORGANISM  Streptomyces lividans
            Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
            Streptomycineae; Streptomycetaceae; Streptomyces.
REFERENCE   1  (bases 1 to 1161)
  AUTHORS   Schrempf,H., Schmidt,O., Kummerlen,R., Hinnah,S., Muller,D.,
            Betzler,M., Steinkamp,T. and Wagner,R.
  TITLE     A prokaryotic potassium ion channel with two predicted
            transmembrane segments from Streptomyces lividans
  JOURNAL   EMBO J. 14 (21), 5170-5178 (1995)
   PUBMED   7489706
REFERENCE   2  (bases 1 to 1161)
  AUTHORS   Schrempf,H.
  TITLE     Direct Submission
  JOURNAL   Submitted (23-SEP-1994) Schrempf H., Abt. AGM, FB Biologie /
            Chemie, Uni Osnabrueck, Barbarastr. 11, D-49090 Osnabrueck, FRG
FEATURES             Location/Qualifiers
     source          1. .1161
                     /organism="Streptomyces lividans"
                     /mol_type="genomic DNA"
                     /strain="1326"
                     /db_xref="taxon:1916"
     gene            330. .812
                     /gene="skc1"
     CDS             330. .812
                     /gene="skc1"
                     /codon_start=1
                     /transl_table=11
                     /product="potassium channel protein"
                     /protein_id="CAA86025.1"
                     /db_xref="GI:1089906"
                     /db_xref="GOA:P0A334"
                     /db_xref="InterPro:IPR001622"
                     /db_xref="InterPro:IPR003091"
                     /db_xref="UniProtKB/Swiss-Prot:P0A334"
                     /translation="MPPMLSGLLARLVKLLLGRHGSALHWRAAGAATVLLVIVLLAGS
                     YLAVLAERGAPGAQLITYPRALWWSVETATTVGYGDLYPVTLWGRLVAVVVMVAGITS
                     FGLVTAALATWFVGREQERRGHFVRHSEKAAEEAYTRTTRALHERFDRLERMLDDNRR
                     "
ORIGIN

  Query Match             99.2%;  Score 1151.4;  DB 15;  Length 1161;
  Best Local Similarity   99.5%;  Pred. No. 2.6e-228;
  Matches 1155;  Conservative    0;  Mismatches    6;  Indels    0;  Gaps    0;

Qy          1 GCATGCTGGCTCCTTTGGGATCGATCCGTCCGGTTCTTCTCCGGCCGGCCACCTCTCGAA 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 GCATGCTGGCTCCTTTGGGATCGATCCGTCCGGTTCTTCTCCGGCCGGCCACCTCTCGAA 60

Qy         61 GGTGACGCTGTCGCCGACGAGCCACCGACATCCGACCGACAGCCCCCGACAGCGCTCCTA 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 GGTGACGCTGTCGCCGACGAGCCACCGACATCCGACCGACAGCCCCCGACAGCGCTCCTA 120

Qy        121 CGCGGTGCCGACATGACACCGACACCGCAGGTCGGACGACGGGGGCTCAGGCGCGACGGG 180
```

```
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         121 CGCGGTGCCGACATGACACCGACACCGCAGGTCGGACGACGGGGGCTCAGGCGCGACGGG 180

Qy         181 CGCGGATCACGACGGCCGTACCGCCGCGACGGCGAGCACCGCCGCGCCGCCGAGGAGTGG 240
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         181 CGCGGATCACGACGGCCGTACCGCCGCGACGGCGAGCACCGCCGCGCCGCCGAGGAGTGG 240

Qy         241 CCGAAGGAGTGAAGATCGGTTACGGACCGTAAAGGAGTACCTGGCGCACCGGCGCGTTGT 300
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         241 CCGAAGGAGTGAAGATCGGTTACGGACCGTAAAGGAGTACCTGGCGCACCGGCGCGTTGT 300

Qy         301 CGCATCGTCGTCCCGGCCGGTGGCGGAGCATGCCACCCATGCTGTCCGGTCTTCTGGCCA 360
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         301 CGCATCGTCGTCCCGGCCGGTGGCGGAGCATGCCACCCATGCTGTCCGGTCTTCTGGCCA 360

Qy         361 GATTGGTCAAACTGCTGCTCGGGCGCCACGGCAGTGCGCTGCACTGGAGGGCCGCGGGTG 420
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         361 GATTGGTCAAACTGCTGCTCGGGCGCCACGGCAGTGCGCTGCACTGGAGGGCCGCGGGTG 420

Qy         421 CCGCGACGGTCCTCCTGGTGATCGTCCTCCTCGCGGGCTCGTACTTGGCCGTCCTGGCTG 480
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         421 CCGCGACGGTCCTCCTGGTGATCGTCCTCCTCGCGGGCTCGTACTTGGCCGTCCTGGCTG 480

Qy         481 AGCGCGGCGCACCGGGCGCGGCGCTGATCTCGTATCCGGACGCGCTGTGGTGGTCCGTGG 540
                ||||||||||||||||||  |||||||  ||||||||   ||||||||||||||||||
Db         481 AGCGCGGCGCACCGGGCGCGCAGCTGATCACGTATCCGCGGGCGCTGTGGTGGTCCGTGG 540

Qy         541 AGACCGCGACGACCGTCGGCTACGGCGACCTGTACCCCGTGACTCTGTGGGGCCGGCTCG 600
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         541 AGACCGCGACGACCGTCGGCTACGGCGACCTGTACCCCGTGACTCTGTGGGGCCGGCTCG 600

Qy         601 TGGCCGTGGTGGTGATGGTCGCCGGGATCACCTCCTTCGGTCTGGTGACCGCCGCGCTGG 660
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         601 TGGCCGTGGTGGTGATGGTCGCCGGGATCACCTCCTTCGGTCTGGTGACCGCCGCGCTGG 660

Qy         661 CCACCTGGTTCGTCGGCCGGGAACAAGAGCGCCGGGGCCACTTCGTGCGCCACTCCGAGA 720
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         661 CCACCTGGTTCGTCGGCCGGGAACAAGAGCGCCGGGGCCACTTCGTGCGCCACTCCGAGA 720

Qy         721 AGGCCGCCGAGGAGGCGTACACGCGGACGACCCGGGCGCTGCACGAGCGTTTCGACCGTT 780
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         721 AGGCCGCCGAGGAGGCGTACACGCGGACGACCCGGGCGCTGCACGAGCGTTTCGACCGTT 780

Qy         781 TGGAGCGAATGCTCGACGACAACCGCCGGTGACTCCGCCGGTGACCGCCCGAGCGAGGCC 840
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         781 TGGAGCGAATGCTCGACGACAACCGCCGGTGACTCCGCCGGTGACCGCCCGAGCGAGGCC 840

Qy         841 GCACCGATGAGTCTGCGGCGGTTGTGCGGTCTACCCGTCGACGAAGGGAGCGCACCATGC 900
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         841 GCACCGATGAGTCTGCGGCGGTTGTGCGGTCTACCCGTCGACGAAGGGAGCGCACCATGC 900

Qy         901 GCAAGATCATCATTTGCACGTTCCTGACGCTGGACGGCGTCATGCAGGCGCCGGGCGGCC 960
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         901 GCAAGATCATCATTTGCACGTTCCTGACGCTGGACGGCGTCATGCAGGCGCCGGGCGGCC 960

Qy         961 CGGACGAGGACGCCGAGAGCGGCTTCGAACACGGCGGCTGGCAGAAGCCGGTGGACGACG 1020
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         961 CGGACGAGGACGCCGAGAGCGGCTTCGAACACGGCGGCTGGCAGAAGCCGGTGGACGACG 1020

Qy        1021 ACGAGGTCGGCACGGCCATCGCCGGCTGGTACGAGGACTCCGACGCCATGCTCCTCGGCC 1080
                ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
```

```
Db       1021 ACGAGGTCGGCACGGCCATCGCCGGCTGGTACGAGGACTCCGACGCCATGCTCCTCGGCC 1080

Qy       1081 GCAAGACCTACGACATCTTCGCGTCGTACTGGCCGACCGCCGACCCCGACAACCCGTTCA 1140
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1081 GCAAGACCTACGACATCTTCGCGTCGTACTGGCCGACCGCCGACCCCGACAACCCGTTCA 1140

Qy       1141 CCCATCGGATGAACAGCATGC 1161
              |||||||||||||||||||||
Db       1141 CCCATCGGATGAACAGCATGC 1161
```